

torvik River, no. 587 (A); Ogualik Island, nos. 586, 586a (B); Valley of the Twin Falls, Kaumajet Mountains, no. 581 (A); base of the hill back of the Moravian Mission, Hopedale, nos. 579, 580 (A & H).

CREPIS NANA Richards. On the lower ridge above the Valley of the Twin Falls, Kaumajet Mountains, no. 599 (A).

This collection is a single individual of a very rare species. It was growing in the exceedingly well-drained gravel formed by the decomposition of the basic rocks of the Mugford series. Although an extensive search was made for other individuals, none were found. It is of interest that it is also very rare and local in Newfoundland as Professor Fernald<sup>1</sup> indicates in his dramatic description of its discovery on the dry limestone barrens of Burnt Cape. The only other records in eastern North America for this rarity are from Rama on the coast of Labrador where it was collected in 1897 by *Sornborger*, and in 1899 by *Stecker*, from an outcrop of slate.<sup>2</sup> There is still another record of a very ambiguous nature in the Gray Herbarium. A single plant of *Crepis nana* has associated with it a label which indicates that it was collected by "Waitz" at "O. Kuk," Labrador and also by "Wietz" at Northumberland Bay. Under the circumstances this specimen with its dual data can hardly be considered. As far as we have good records this interesting little plant appears to occur only on areas of basic rock in eastern North America.

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## THE PRODUCTION OF SEED BY EUPHORBIA CYPARISSIAS

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AN illustration of a common weed in which the production of seeds is thought to be of rare occurrence is *Euphorbia Cyparissias*, commonly known as Cypress Spurge or Graveyard Weed. This plant was one of the early introductions into America and was formerly extensively planted as an ornamental. The distribution and spread of this perennial by vegetative propagation by its roots has been pointed out by Deane, who believed that, "the plant has in a great measure lost its power of setting fruit, at least in America."<sup>3</sup> Deane recorded the production of seeds by *Euphorbia Cyparissias* at Shelburne,

<sup>1</sup> RHODORA, xxviii. 103-104 (1926).

<sup>2</sup> Fernald and Sornborger, Ottawa Nat. xiii. 107 (1899).

<sup>3</sup> Deane, W. RHODORA 12: 57-61. 1910.

N. H. Other cases of seed production were reported from Pittsfield, Massachusetts in 1925<sup>1</sup> and from Franklin, St. Lawrence, Herkimer and Orange Counties in New York in 1931.<sup>2</sup>

Several years ago while I was attempting to determine the conditions necessary for the formation of seeds in *Euphorbia Cyparissias* an explanation of the problem was suggested in the following statement: "About 35 years ago we seeded a dry hillside with a mixture of grass seed recommended for such soils, which was evidently heavily infested with seed of Cypress Spurge (*Euphorbia Cyparissias*) as this plant appeared throughout the entire field the following season and has flourished there and spread to surrounding fields ever since that time. This plant was often found growing in old cemeteries but this was the first instance where we had known it to take possession of fields which were mowed or pastured."<sup>3</sup>

In western New York the Cypress Spurge is widespread as a weed but each infestation may be assumed to represent the offspring from a single piece or root, or a patch that was started vegetatively. Many, if not most, of the infestations in a locality may represent the offspring from pieces of root, all originating from a single plant—the offspring from a single seed—a clone. No seeds are formed.

In the extensive and spreading infestations at Pittsfield, Mass. and in eastern New York, the Cypress Spurge was started from seeds—each of these infestations represents the offspring from numerous plants. Here seeds are produced in abundance.

By assuming that the Cypress Spurge is self sterile, the conditions mentioned for western New York would prevent seed formation and the conditions in the eastern infestations mentioned would account for the production of seeds. To test this hypothesis 2 series of experiments were made.

*First*, colonies of Cypress Spurge were started from 22 localities within a radius of 20 miles of Ithaca, Tompkins County, New York, where no seeds were known to have been produced. None of these colonies produced seed when self pollinated; 19 colonies failed to produce seed when pollinated with their own pollen or with each others' pollen. The other 3 colonies were unable to fertilize each others, flowers but produced pollen which would fertilize the other 19 so that they would produce seeds. When plants of these 3 colonies

<sup>1</sup> Lombard, T. L. Pittsfield, Mass. Letter and specimen dated May 9, 1925.

<sup>2</sup> Muenscher, W. C. and Bassett Maguire. RHODORA 33: 165-167. 1931.

<sup>3</sup> Crabtree, John A. Montgomery, N. Y. Letter dated July 18, 1930.

were pollinated with pollen from any one of the 19 colonies, seeds were produced. This behavior leads to the conclusion that the 22 colonies tested represent offspring from only 2 seeds.

*Second*, plants were started from seed. Each seedling was grown with precautions so that its root-system could not intermingle with that of the other seedlings. At the age of one year, the root-system of each of 20 seedlings was divided into 2 parts. One half of each seedling was used to start an isolated colony on some abandoned farmland and the corresponding half of each seedling was planted in a row in my garden. The isolated colonies representing the offspring from single seeds have been under observation for 3 years without a single seed having been produced. These patches correspond to the patches in and about the cemeteries of Tompkins County and are sterile. The colonies in the garden produced abundant seed every year. However, those flower clusters which had been bagged produced seed only when cross pollinated and not when selfed. These patches correspond to the areas in eastern New York each of which had been started from several seeds.

It appears that the failure of seed production by Cypress Spurge under certain conditions is due to self sterility and the ability to produce seed by this species is not affected by its highly developed method of vegetative reproduction whereby it may reproduce and spread for many years. The evidence here presented indicates that if a colony represents offspring from a single seed it is barren, but if a colony represents the offspring from several seeds it fruits freely and produces viable seeds in abundance.

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SMALL'S "FERNS OF THE VICINITY OF NEW YORK."<sup>1</sup>—For a long time Dr. Small has had an especial interest in ferns. Amateurs and students of the group in the northeastern United States may congratulate themselves that this interest has lured him from his usual field in the South into their territory. For the result is a compact, handy and excellent manual of fernworts which, though it treats directly only the New York local flora area (a circle with a radius of 100 miles and the city as center), will serve quite adequately for most of New England and a considerable fraction of the Middle States. It comes at a time when most of the familiar fern books are out of print; and it is one of the few of its kind written by a competent and experienced professional botanist.

About 90 species are keyed, described and illustrated (except *Isoetes*) with neat and accurate line drawings, mostly by Miss Grace George.

<sup>1</sup> Small, J. K. Ferns of the Vicinity of New York. 285 pp., figs. The Science Press, Lancaster, Pennsylvania. \$2.50.